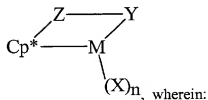


CLAIMS:

1. A catalyst composition for olefin polymerization comprising:

(A) a metal coordination complex of the formula:



(a) M is titanium;

(b) Cp\* is selected from the group consisting of cyclopentadienyl and R"<sub>m</sub>-substituted cyclopentadienyl, bound in an η<sup>5</sup> bonding mode to M, wherein R" is independently selected from the group consisting of alkyl of up to 20 carbon atoms and aryl of up to 20 carbon atoms and two adjacent R" groups may join to form a ring and m is 1 to 4;

(c) Z is selected from the group consisting of CR'<sub>2</sub>, CR'<sub>2</sub>CR'<sub>2</sub>, SiR'<sub>2</sub>, and SiR'<sub>2</sub>SiR'<sub>2</sub>, wherein each R' is independently selected from the group consisting of alkyl of up to 20 carbon atoms, aryl of up to 20 carbon atoms, and mixtures thereof of up to 20 carbon atoms;

(d) Y is NR or PR, wherein R is selected from the group consisting of alkyl of up to 20 carbon atoms, aryl of up to 20 carbon atoms, and mixtures thereof of up to 20 carbon atoms;

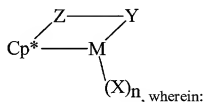
(e) X is, independently each occurrence, selected from the group consisting of hydride, halide, alkyl of up to 30 carbon atoms, aryl of up to 30 carbon atoms, aryloxy of up to a total of 30 carbon and oxygen atoms, alkoxy of up to a total of 30 carbon and oxygen atoms, cyanide, aide, acetylacetone, norbornyl, and benzyl; and

(f) n is 2; and

(B) an activating cocatalyst selected from the group consisting of aluminum alkyls, aluminum halides, aluminum alkylhalides, Lewis acids, ammonium salts, noninterfering oxidizing agents, and mixtures thereof.

2. A catalyst composition for olefin polymerization comprising:

(A) a metal coordination complex of the formula:



(a) M is titanium;

(b)  $\text{Cp}^*$  is selected from the group consisting of indenyl, tetrahydroindenyl, fluorenyl, octahydrofluorenyl, cyclopentadienyl, and  $\text{R}''_m$ -substituted cyclopentadienyl, bound in an  $\eta^5$  bonding mode to M, wherein  $\text{R}''$  is independently selected from the group consisting of alkyl of up to 20 carbon atoms and aryl of up to 20 carbon atoms;

(c) Z is selected from the group consisting of  $\text{CR}'_2$ ,  $\text{CR}'_2\text{CR}'_2$ ,  $\text{SiR}'_2$ , and  $\text{SiR}'_2\text{SiR}'_2$ , wherein each  $\text{R}'$  is independently selected from the group consisting of alkyl of up to 20 carbon atoms, aryl of up to 20 carbon atoms, and mixtures thereof of up to 20 carbon atoms;

(d) Y is NR or PR, wherein R is selected from the group consisting of alkyl of up to 20 carbon atoms, aryl of up to 20 carbon atoms, and mixtures thereof of up to 20 carbon atoms;

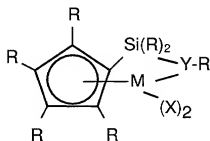
(e) X is, independently each occurrence, selected from the group consisting of hydride, halide, alkyl of up to 30 carbon atoms, aryl of up to 30 carbon atoms, aryloxy of up to a total of 30 carbon and oxygen atoms, alkoxy of up to a total of 30 carbon and oxygen atoms, cyanide, aide, acetylacetonate, norbornyl, and benzyl; and

(f) n is 2; and

(B) an activating cocatalyst selected from the group consisting of aluminum alkyls, aluminum halides, aluminum alkylhalides, Lewis acids, ammonium salts, noninterfering oxidizing agents, and mixtures thereof.

3. A catalyst composition for olefin polymerization comprising:

(A) a metal coordination complex of the formula:



, wherein:

M is titanium;

R each occurrence is independently selected from the group consisting of alkyl, and aryl of up to 10 carbons;

Y is nitrogen; and

X independently each occurrence is halo, alkyl, aryl, or alkoxy of up to 10 carbons; and

(B) an activating cocatalyst selected from the group consisting of aluminum alkyls, aluminum halides, aluminum alkylhalides, Lewis acids, ammonium salts, noninterfering oxidizing agents, and mixtures thereof.

4. A catalyst composition according to any one of claims 1-3 wherein the activating cocatalyst is a Lewis acid or noninterfering oxidizing agent.

5. A process for preparing an olefin polymer comprising the step of polymerizing an olefin in the presence of a catalyst composition according to any one of claims 1-3.

6. A process for preparing an olefin polymer comprising the step of polymerizing an olefin in the presence of a catalyst composition according to claim 4.